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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/038,946	01/03/2002	Jerald S. Burkett	BUJ 005 P2	2174
7590	11/30/2004		EXAMINER	
Kremblas, Foster, Phillips & Pollick 7632 Slate Ridge Boulevard Reynoldsburg, OH 43068			BINDA, GREGORY JOHN	
			ART UNIT	PAPER NUMBER
			3679	

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/038,946	BURKETT, JERALD S.
	Examiner Greg Binda	Art Unit 3679

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 08 June 2004.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-20 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-20 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 08 June 2004 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) _____
2) <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 8, 2004 has been entered.

Response to Amendment

3. The amendment to the claims filed on June 8, 2004 does not comply with the requirements of 37 CFR 1.121(c) because:

- a. The claim listing does not commence on a separate sheet of the amendment document .
- b. New claims 17 & 20 include markings to indicate changes.

Drawings

4. The replacement drawings filed June 8, 2004 are objected to because:
 - a. Fig. 5 fails to include the changes in the drawing correction filed October 20, 2003.
 - b. Fig. 5 fails to show a distinct layer corresponding to the "adhesion layer 48 between the entire exterior surface of the inner tube member [12] and the composite material [18]" described on page 8, lines 15-17 as originally filed. The lead line for reference numeral

48 does not even point to the interface between the exterior surface of the inner tube member 12 and the composite material 18. Applicant argues that the adhesion layer “is shown by reference numeral 48”. However, a reference numeral and its lead line are supposed to indicate a feature. Since no adhesion layer is indicated by the reference numeral 48 and its lead line, the objection is valid.

5. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

6. The disclosure is objected to because at page 8, line 8 an incorrect reference numeral is used to identify the composite material 18.

Claim Rejections - 35 USC § 112

7. Claims 17-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 17, line 8 recites the limitation, "said shaft being open ended at both ends." There does appear to be a written description of the shaft 10 having open ends in the application as originally filed.

Applicant states on page 12 of the amendment filed June 8, 2004 that the limitation is supported by the originally filed drawings, Figs. 1, 2, 4B and 5. However, of those drawings, Fig. 5 is the only one that clearly shows the end structure of the shaft 10. In Fig. 5 there are at least seven solid lines running across the opening in the end member 14. Since any one or all of those solid lines could indicate structure which plugs the opening in the end member 14, the drawings by themselves cannot be relied upon to provide support for the limitation.

8. Claims 8 & 13-16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with

which it is most nearly connected, to make and/or use the invention. Claim 8, lines 2 & 3 and claim 13, lines 7-9, recite the limitation, "the composite material defines a geodesic isotensoid elliptical shape derived with reference to the angle of the fibers". However, "a series of [well known] differential equations" are required to make the structure corresponding to this limitation per page 14, line 10. There is no further description of the required equations nor is there any evidence to support the assumption that said equations are "well known". In amendment filed October 2, 2003 on page 12 applicant states that a NASA program is needed to make the claimed invention, but no such program or its equivalent is provided in the disclosure. Therefore undue experimentation would be required of one skilled in the art to make and/or use the claimed invention due to the numerous parameters involved.

9. Claims 3, 8, 13-16 & 19 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- a. Claims 3, 14 & 19 recite the limitation, "a natural frequency greater than a predetermined maximum rotational operating speed" (which corresponds to the description at paragraph 0030). However, it is not clear how a frequency and a speed can be compared so as to determine one being greater than the other. Frequency is expressed as cycles per time and speed is expressed as distance per time. As such, attempting to compare frequency to speed is like comparing an apple to an orange.
- b. Claim 8, line 2 and claim 13, lines 8 & 9 recites the limitation, "the composite material defines a geodesic isotensoid elliptical shape". Its not clear how the composite

material 18 would constitute such a shape given that the drawings merely show composite material 18 as a cover over the inner tube member 12 and the end pieces 14 & 16. That is, the composite material appears to simply assume the shape of the elements it covers.

Claim Rejections - 35 USC § 103

10. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kreft, US 3,850,722 in view of Williams, US 3,553,978 (Williams).

a. Claims 1-16. In Fig. 2a Kreft shows a shaft for the transmission of torsional loads (see also abstract lines 1 & 2), the shaft comprising: an elongated inner tube member 5 having opposed open ends; at least one end piece 3; a composite material (see "a synthetic fiber . . . wound over" in col. 4, lines 14-16) covering the inner tube member 5 and a convexly curved portion (see Fig. 1 and "dished outer contour" in col. 4, line 18) of the end piece 3. Torque is transmitted **directly** from the inner tube member 5 to the end piece 3 via the clamping ring 2. Torque is transmitted **indirectly** (i.e. through composite material) from the inner tube member 5 to the end piece 3 (see col. 4, lines 28-32). Fig. 3 shows an additional sacrificial layer 6b of fibers oriented 90 degrees relative to the inner tube 5. The angle of twist at failure of the inner tube member 5 and the composite material are the same because they both comprise the same materials of construction. In Fig. 2b Kreft shows all the fibers 6 oriented at a single angle (to the same extent that instant Fig. 4A shows all the fibers 50 oriented at a single angle α). In Fig. 2b Kreft shows the portion of the end piece 3 covered with the composite material defines a

geodesic isotensoid elliptical shape derived with reference to the angle of the fibers 6 (to the same extent that instant Fig. 5 shows the portion 20 of the end piece 14 covered with the composite material 18 defines a geodesic isotensoid elliptical shape derived with reference to the angle of the fibers). The shaft in Kreft can be limited to speeds below the first natural frequency of the shaft and to operating loads below maximum operating strength. Kreft does not show the end piece 3 including a knurled exterior where it is connected to the composite material. In col. 2, lines 10-12 and col. 3, lines 20-25 Williams teaches including a knurled exterior 18 on an end piece 12 where it is connected to a composite material 24 in order to provide a strong interlock that will not easily break between the end piece and the composite material. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the shaft of Kreft by including a knurled exterior on the exterior of the end piece 3 where it is connected to the composite material in order to provide a strong interlock that will not easily break between the end piece and the composite material as taught by Williams.

b. Claims 17-20. As noted above, a shaft comprising all the limitations of claims 1-16 is obvious in view of Kreft and Williams. However, neither Kreft nor Williams shows a shaft having, in addition to all the limitations of those claims, an open end at both ends of the shaft. However, modifying the combination of Kreft and Williams so that the shaft has open ends would have been obvious to one of ordinary skill in the art for either one or both of the following reasons:

- i. It would have been an obvious matter of design choice to make the shaft with open ends, since such a modification would have involved a mere change in

the shape of the end pieces 3. A change in shape is generally recognized as being within the level of ordinary skill in the art. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

ii. Applicant has not disclosed that providing the shaft with opened ends solves any stated problem or is for any particular purpose. Moreover, it appears that the shaft would perform equally well with the ends being closed or opened. Accordingly, the use of open ends is deemed to be a design consideration which fails to patentably distinguish over the prior art to Kreft and Williams.

Response to Arguments

11. Applicant's arguments filed in June 8, 2004 have been fully considered but they are not persuasive.

a. Applicant argues that claims 8 & 13 are enabled because a number of U.S. patents describe windings that "could be geodesic and elliptical". The existence of such patents does not overcome any shortcoming in the specification because their existence in no way enables one skilled in the art of shaft making (armed only with average skill and the instant disclosure) to make and/or use the claimed invention.

b. Applicant argues that claims 8 & 13 are enabled because a number of U.S. patents describe windings that "could be geodesic and elliptical". However, at best, those patents appear to be related only to pressure vessels. Since pressure vessels are (as applicant himself concedes on page 14 of the amendment) non-analogous art, they have

no bearing on determining what would or would not be known to one of ordinary skill in the art of the claimed invention.

c. Applicant argues that Kreft fails to show an elongated inner tube member having opposed open ends because core 5 is allegedly solid. However, cutaway view Fig. 2A clearly shows core 5 is in the shape of a hollow tube. Furthermore, Kreft expressly discloses in col. 1, lines 3, 5 & 52; col. 3, line 36; and col. 4, line 4, that this element 5 is "tubular" (i.e. hollow) which indicates, along with Figs. 1 & 2a that the opposed ends of the tube 5 are open.

d. Applicant argues that the outer portion of the tube 5 shown in Fig. 2a of Kreft is actually a separate layer 6 laid over a solid core 5. However, the so-called layer 6 cited by applicant is actually the tube 5. Reference numeral 6 (as is clearly shown by its lead lines) indicates only the fibers present in the material of the tube 5 (see also "fibers 6" in col. 4, lines 9 & 10).

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Greg Binda whose telephone number is (703) 305-2869. The examiner can normally be reached on M-F 9:30 am to 7:00 pm with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel P. Stodola can be reached on (703) 308-2686. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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